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(58) Field of search

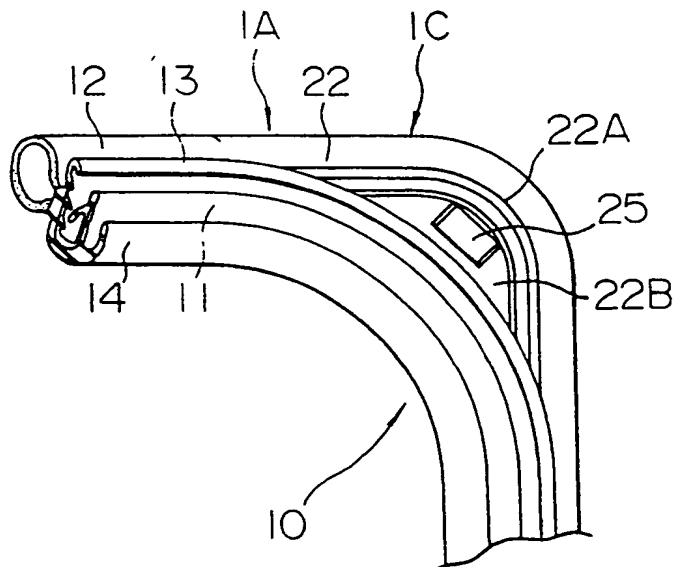
UK CL (Edition K) B5A, E1J JGN JM

INT CL⁵ B29C, B60J

(54) Automotive weatherstrip

(57) An automotive weatherstrip (10) mounted along a peripheral flange of a door opening includes a trim part (11) of U-shaped cross-section and a hollow seal part (12) for contacting a peripheral edge of a door (20), protruding generally perpendicular from one side of said trim part (11). The trim part (11), at a corner portion of the door opening, is curvedly formed by cutting away a portion of the hollow seal part (12). A molded hollow seal part (22), at the corner portion, is integrally molded with the trim part (11) and has an outer configuration substantially similar to that of the hollow seal part (12). The molded hollow seal part (22) is circumferentially offset from the curved trim part (11) so as to extend along an upper side and a vertical side of the door opening. A generally triangular covering part is provided to cover a side surface of the trim part (11) from which the hollow seal part (12) is cut away and is integrally molded with the molded hollow seal part (22).

FIG. 3



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FIG. 1

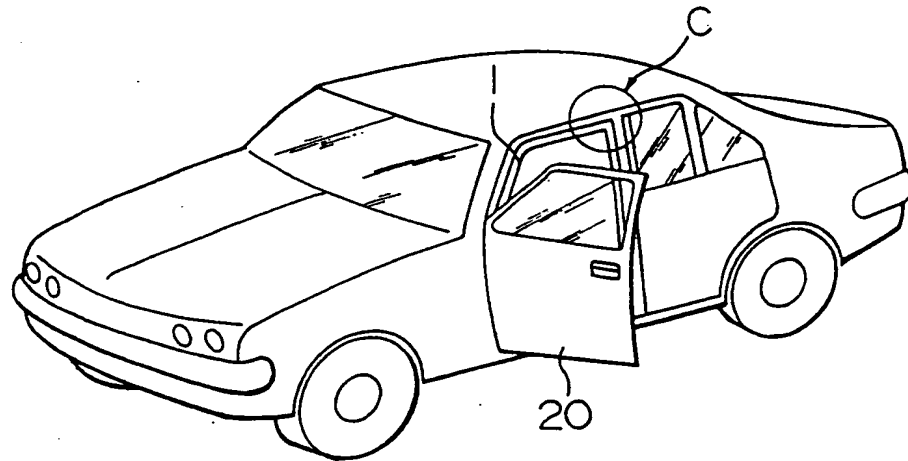
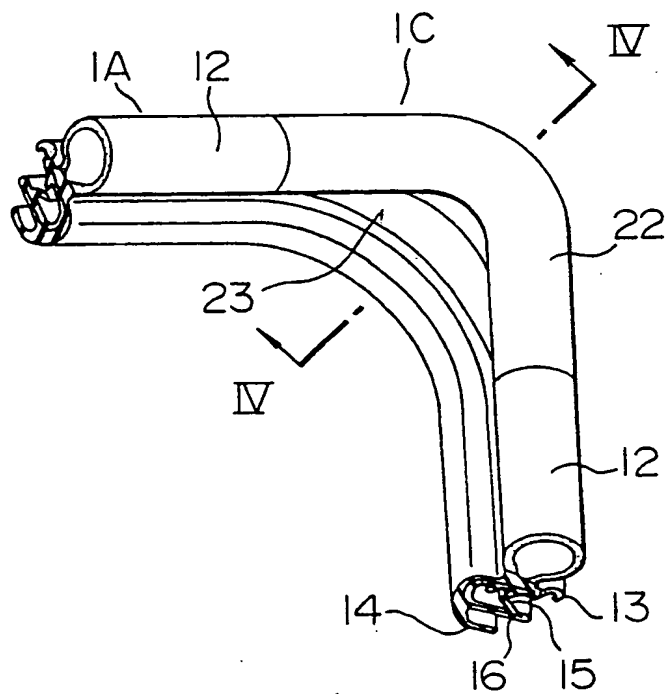


FIG. 2



213

FIG. 3

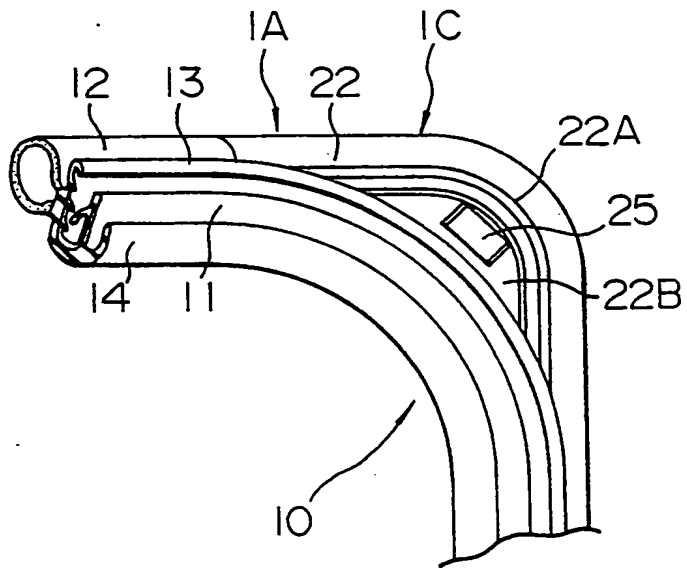
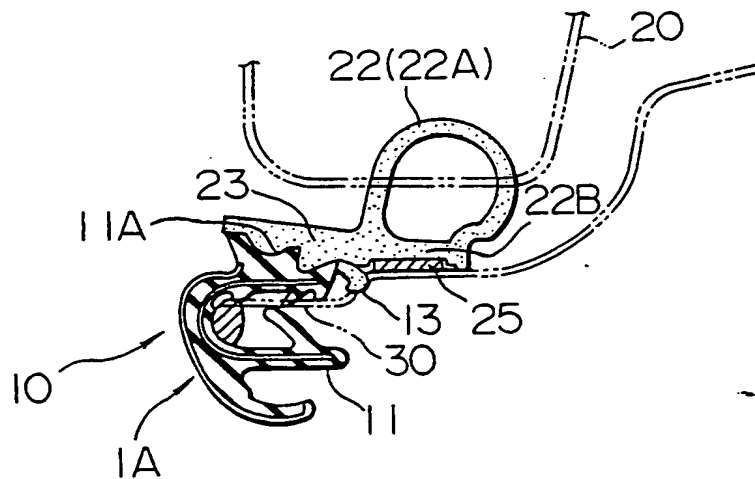


FIG. 4



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FIG. 5

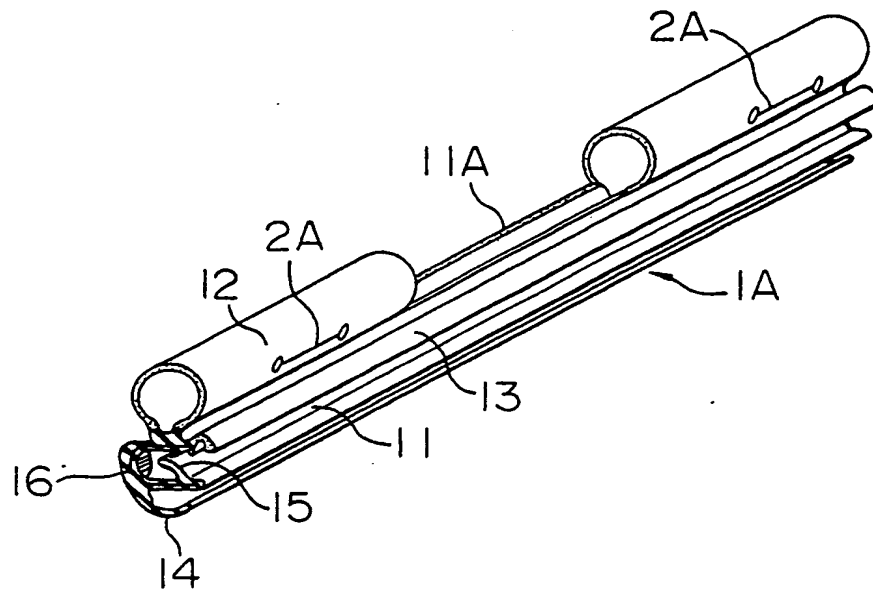
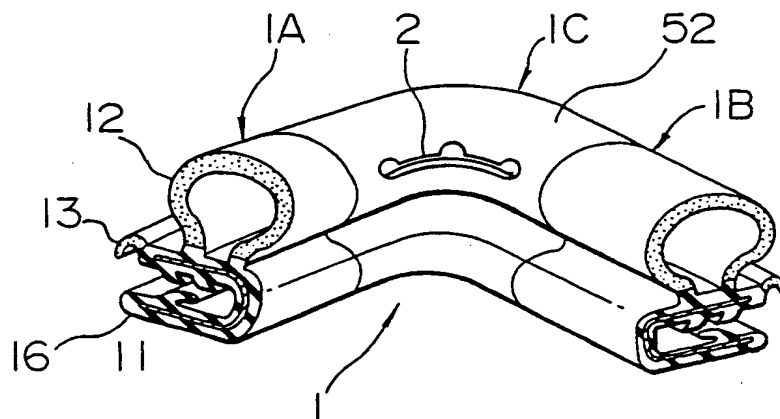


FIG. 6



AUTOMOTIVE WEATHERSTRIP

1 BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

The present invention relates to an automotive weatherstrip and more particularly to a configuration of
5 a corner portion of a door weatherstrip mounted along a peripheral flange of a door opening of an automobile to seal the door and the peripheral edge of the door opening.

2. DESCRIPTION OF RELATED ART

10 The prior art utilizes an extruded member as a weatherstrip 1 mounted along the peripheral edge of a door opening of a general automobile as shown in Fig. 1. The weatherstrip 1 includes a trim part 11 a cross-section of which is generally U-shaped to be held by a
15 peripheral flange 30 (Fig. 4) of a door opening, a hollow seal part 12 protruding perpendicularly from one side of the trim part 11 and being pressed upon by a peripheral edge of a door 20, and a body seal lip 13 formed in a manner such that an edge of an opening side of the trim
20 part 11 engages with the flange 30 side of the peripheral edge of the door opening, as shown in Fig. 6.

However, when the extruded member is bent along the corner portion C (Fig. 1) of the peripheral flange 30 of the door opening, the seal part 12 is irregularly
25 deformed which causes the peripheral edge of the door 20

1 to have a low quality seal. Therefore, in this corner
portion C, a molded member 1C is formed which connects
the extruded members. As shown in Fig. 6, this connec-
tion is generally performed by placing ends 1A and 1B of
5 each extruded members so that they meet at a substantial
right angle, mounting the extruded member in the cavity
of a mold wherein a core for molding a molded hollow seal
part 52 is also mounted, and injecting molding materials
into the cavity. After the completion of the molding,
10 the core is pulled out. Therefore, an inevitable
aperture 2 is present, through which the core is pulled
out from the molded hollow seal part 52 of the molded
member 1C. In the prior art, the aperture 2 is located
in the inner-diameter-side of the curvature of the corner
15 portion, and the opening of the aperture 2 must be bonded
by an adhesive to close it, after the completion of the
molding.

However, regarding the weatherstrip 1, when the
aperture 2 for the core is closed, a sectional area of
20 the molded hollow seal part 52 of the molded member 1C is
reduced by an amount equal to the width of the aperture
2. Thus, due to the reduced sealing area, low quality
seal results.

In addition, as the molded hollow seal part 52
25 of the molded member 1C is formed to protrude generally
perpendicular from one side of the trim part and is
formed with the same radius as that of the curvature of
the flange 30 of the body panel, the molded hollow seal

1 part 52 does not correspond to a shape of the corner
portion having a generally right angled corner at the
peripheral edge of the door, which causes a low quality
seal between the seal part and the corner portion of the
5 door.

SUMMARY OF THE INVENTION

An object of the invention is to provide an
automotive weatherstrip capable of overcoming the draw-
backs of the related art and exhibiting a high quality
10 seal between a molded hollow seal part at a corner of a
door opening and a peripheral edge of a door.

An automotive weatherstrip mounted along a
peripheral flange of a door opening of an automobile and
formed by an extrusion according to the invention
15 comprises a trim part having a generally U-shaped cross-
section to be held by the peripheral flange of the door
opening and a hollow seal part which contacts a periph-
eral edge of a door, protruding generally perpendicular
from one side of the trim part. The trim part is
20 curvedly formed at a corner portion of the peripheral
flange of the door opening by cutting away a portion of
the hollow seal part so as to be held on a curved flange
of the door opening. A molded hollow seal part, disposed
at the corner portion, is integrally molded with the trim
25 part of the extrusion and has an outer configuration
substantially similar to that of the hollow seal part.
The molded hollow seal part is circumferentially offset

1 from the curved trim part so as to extend along an upper
side and a vertical side of the correspondingly
peripheral edge of the door. A generally triangular
covering part is provided to cover a side surface of the
5 trim part from which the hollow seal part is cut away and
is integrally molded with the molded hollow seal part.

The automotive weatherstrip of the present
invention does not have an aperture in the molded hollow
seal part through which the core is pulled out. There-
10 fore, the sectional area of the molded hollow seal part
will not reduce in size and the sealing area will not
become smaller to impair the quality of sealing.
Furthermore, the molded hollow seal part to be pressed by
the door is formed to correspond to the corner portion of
15 the door having a substantially right angled peripheral
edge, which successfully provides a wider sealing area of
the seal part upon which the peripheral edge of the door
presses.

Other objects and features of the present
20 invention will become apparent by reference to the
following drawings wherein the same reference numbers are
used for those parts of a weatherstrip according to the
present invention and the related art which are
identical.

25 BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of a conventional
automobile to which, a weatherstrip according to the

1 present invention, may be mounted on a door portion thereof.

FIG. 2 is a perspective view of an outer side of a corner portion of a weatherstrip provided in accordance with the principles of the present invention.

FIG. 3 is a perspective view of an inner side of a corner portion of the weatherstrip of the present invention.

FIG. 4 is a sectional view taken along line IV-IV in FIG. 2 showing the weatherstrip mounted on a peripheral edge of a door opening.

FIG. 5 is a perspective view illustrating the weatherstrip according to the present invention of which a seal part of an extruded member has been cut during the manufacturing of the weatherstrip.

FIG. 6 is a partly sectioned perspective view of a corner portion of a weatherstrip of the prior art.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

At a corner portion C, a weatherstrip 10 which is to be mounted along a peripheral flange 30 (Fig. 4) of a door opening of an automobile, as shown in FIG. 1, includes a trim part 11, a cross-section of which is generally U-shaped; an extruded member 1A having a portion of seal part 12 cut away and curved as illustrated in FIGS. 2 to 5; a molded hollow seal part 22 having a generally round and hollow cross-section, provided at a position circumferentially offset from the trim part 11,

1 and bent to conform with a corner portion of a door 20
having a substantially, right angled peripheral portion;
and a generally triangular covering part 23 which covers
a cut surface 11A of the extruded hollow seal part 12
5 located on a side of the trim part 11 and integrally
molded with the molded hollow seal part 22. Accordingly,
as shown in Fig. 2, the corner portion of the weather-
strip 10 comprises the extruded member 1A for mounting
the trim part 11 on a peripheral flange 30 of a body
10 panel and molded member 1C defining the remaining part of
the corner portion.

The extruded member 1A includes, in the same
manner as the prior art, the trim part 11 having a
generally U-shaped cross-section; the hollow seal part 12
15 having a generally round and hollow cross-section and
protruding in a substantially perpendicular direction
from one side (the outer side of the body panel) of the
trim part 11 whereon the pressure of a peripheral portion
of a door 20 is applied; a body seal lip 13; a lip 14
20 which protrudes from the inner side of the body into the
outer side of the body on the trim part 11 and covers an
end part of interior members which is not shown in the
appended FIGs; and flange-holding lips 15 formed inside
of the trim part 11. A reinforcing insert 16 is embedded
25 in the trim part 11 and decorative fabrics are adhered to
outer surfaces of the trim part 11 and the lip 14.

The following is a description of a manufactur-
ing method for the corner portion of the weatherstrip 10.

1 In the first place, a portion of the hollow seal part 12
is cut away from the extruded member 1A as shown in FIG.
5. Then, the trim part 11 with cut seal part 12 is bent
in accordance with a radius of curvature of a peripheral
5 flange 30 of the body panel and mounted in a predeter-
mined position of a mold cavity. The cavity for molding
the molded hollow seal part 22 is formed by a concave
having generally the same outer configuration as that of
the hollow seal part 12 of the extruded member 1A,
10 extending in each direction along the upper side and
vertical side of the door opening enabling these two
cavity lines to meet at a position peripheral to the bent
trim part 11. Accordingly, these cavity lines meet and
form a curvature of a substantial right angle correspond-
15 ing to the shape of the corner portion of the peripheral
edge of the door 20. A generally triangular concave for
molding the covering part 23 to cover the cut portion 11A
of the seal part 12 on the side of the trim part 11 of
the extruded member 1A is formed in the cavity.

20 A core for molding the molded hollow seal part
22 is inserted through slits 2A provided at the hollow
seal parts 12 of the extruded member 1A, and then pulled
out therefrom. A molded part 1C having the molded hollow
seal part 22 and the covering part 23 is made by placing
25 the above mentioned core in the predetermined position of
the cavity of the mold and then by injecting molding
materials into the cavity. After completing the molding,
the molded part 1C is taken out from the cavity and the

1 core is pulled out through the slits 2A, thus completing
the corner portion.

The molded hollow seal part 22 molded in the
above manner does not have an aperture 2, which is
5 provided in the conventional molded hollow seal part 52,
for pulling the core therefrom. Therefore, a section of
the molded hollow seal part 22 cannot be reduced after
molding, and a high quality seal is maintained. Although
slits 2A, through which the core is pulled out, are
10 provided in the hollow seal part 12 of the extruded
member 1A, a section of the hollow seal part 12 will
normally keep its originally extruded shape and will not
reduce in size since the extruded member 1A is provided
with the slits 2A after the extrusion of member 1A. The
15 slits 2A are opened only when the core is being inserted
therein and pulled out therefrom.

The molded hollow seal part 22 is bent at a
position circumferentially offset from the trim part 11
corresponding to a configuration of a peripheral edge of
20 the door 20, which presses on the molded hollow seal part
22. The lower surface of a flange side 22B which is also
a portion of an offset part 22A of the molded hollow seal
part 22, forms a fixed face generally parallel to the
side of the peripheral flange 30 of the body panel. A
25 pressure sensitive adhesive double coated tape 25 is
applied to the fixed face to secure the offset part 22A
of the molded hollow seal part 22 onto the flange 30.
The offset part 22A cannot slide or be tucked up and

1 therefore, high quality seal in the peripheral edge of
the door 20 is obtained since the molded hollow seal part
22 of the present invention has a wider sealing area than
that of the prior art. Instead of the pressure sensitive
5 adhesive double coated tape 25, a bonding agent or an
adhesive can also be used for fixing the molded hollow
seal part 22 on the fixed surface 22B.

In the molding process, the generally
triangular covering part 23, which covers the cut face
10 11A of the hollow seal part 12 located on the side of the
trim part 11 of the extruded member 1A, is molded in one
unit with the trim part 11. Therefore, the appearance of
the trim part 11 will not be impaired. In addition,
because the covering part 23 functions to detain a
15 restoring force of the bent trim part 11, the curvature
of the trim part 11 is maintained. Thus, the weather-
strip 10 can be mounted in a predetermined position.

The automotive weatherstrip of the present
invention does not have the aperture in the molded hollow
20 seal part through which the core is pulled out. There-
fore, the section of the molded hollow seal part will not
reduce in size and the sealing area thereof will not
become smaller to impair the sealing quality.

The molded hollow seal part, upon which the
25 door is to be pressed, is formed to correspond to the
corner portion of the door with a substantially right
angled peripheral edge. Namely, the outer configuration
of the molded hollow seal part is generally the same as

3. An automotive weatherstrip according to Claim 1, wherein slits are formed on said hollow seal part near said molded hollow seal part, said slits utilized to remove molding cores.
4. An automotive weatherstrip according to Claim 1, wherein a lower surface of said offset molded hollow seal part is made to be parallel with a body panel of the automobile.
5. An automotive weatherstrip according to Claim 4, wherein said lower surface includes means for bonding said offset portion to the body panel.
6. An automotive weatherstrip according to Claim 5, wherein said bonding means comprises one of a pressure sensitive double coated adhesive tape and a bonding agent.
7. A method of forming an automotive weatherstrip for mounting along a peripheral flange of a door opening of an automobile comprising the steps of:
 - extruding a trim part having a generally U-shaped cross-section;
 - forming a hollow seal part so as to protrude from one side of said trim part;
 - cutting away a portion of said hollow seal part;
 - integrally molding a molded hollow seal part with said trim part where said portion of said hollow seal part had been cut away so as to form a corner portion of the weatherstrip; and

integrally moulding a generally triangular part with said moulded hollow seal part so as to cover a side surface of said trim part from which said hollow seal part had been cut away.

8. An automotive weatherstrip constructed and arranged substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

9. A method of forming an automotive weatherstrip for mounting along a peripheral edge of a door opening of an automobile substantially as hereinbefore described with reference to the accompanying drawings.

Patents Act 1977

Examiner's report to the Comptroller under
Section 17 (The Search Report)

Application number

GB 9215247.9

Relevant Technical fields

(i) UK Cl (Edition L) E1J (JGN, JM): B5A

(ii) Int Cl (Edition 5) B60J: B29C

Databases (see over)

(i) UK Patent Office

(ii)

Search Examiner

A H MITCHELL

Date of Search

9 DECEMBER 1992

Documents considered relevant following a search in respect of claims 1-9

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 1544420 (DRAFTEX) Note Figures 3-11	7
X	GB 1488272 (DRAFTEX) Note the corner piece 18	7

Category	Identity of document and relevant passages	Relevant to claim(s).

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